

Environmental and sustainability non-formal education for older adults

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Abstract

This study aims to explore the pedagogical potential of non-formal courses to enhance older adults' understanding of the environment and sustainable development. Individual interviews were conducted at a Swedish folk high school. The researchers employ Dewey's concept of experience and Bildung theory. The analysis focused on the pedagogical potential of the older participants' experiences within the course. Five themes were identified: (i) Potential to get new and deeper perspectives on nature and the environment, (ii) Potential to create critical reflection on politics, (iii) Potential to re-evaluate values and knowledge in a sustainable transformation, (iv) Potential to take responsibility for other individuals and future generations, (v) Potential to recognise the rights of other species. The results reveal that participants use prior experiences to understand course content and that voluntary folk high school courses can support intellectual and moral growth regarding environmental and sustainability issues.

Keywords: older adults, education, experience, environmental, sustainability

Introduction

Society faces an increasingly severe ecological crisis, making a profound and wide-ranging transformation to a sustainable society necessary (Boström & Lidskog, 2024). To succeed, the transformation must be rooted in the entire population and enable different groups to voice their perspectives. Education and learning are emphasised as central to this process (United Nations Educational, Scientific and Cultural Organization

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[UNESCO], 2017). Research on Environmental and Sustainability Education (ESE) has expanded significantly over the past 50 years (for an overview, see Macintyre et al., 2025). The European research network Environmental and Sustainability Education Research (ESER, NW30) now includes over 500 researchers, and the Nordic research network on ESE alone involves more than 200 researchers. Research has primarily concentrated on children and youth in formal education, with didactic studies examining the relationship between teaching and learning being particularly prominent, especially in the Nordic countries (Carlsson & Lysgaard, 2025).

Recently, adult learning related to sustainable development has also attracted researchers' attention (e.g., Vandenabeele et al., 2024). The focus has been on exploring what adults need to learn about sustainable development and how educators can enable this to be realised. Education is understood here as a means to develop the competencies that people require to actively participate in the sustainable transformation (Stimm & Dinkelaker, 2024).

However, *older* adults (post-working age) are often overlooked in ESE research, despite becoming an increasingly important part of society. As a result, our understanding of what older adults know and learn about the environment and sustainable development is limited, as is their potential to contribute to a sustainable societal transformation. To address this gap, this study focuses on the learning experiences of older adults in a non-formal course on the natural environment and sustainability issues. The understanding of the participants' experiences is grounded in Dewey's concept of experience. The empirical data consists of semi-structured interviews with eleven senior participants taking part in the course. The course was held at a folk high school in a community in southern Sweden. This study aims to explore the pedagogical potential of non-formal courses to enhance older adults' understanding of the environment and sustainable development.

Courses held as part of study associations at folk high schools are often referred to as *folkbildning* (Bjursell, 2019) and can be defined as non-formal education, which is systematic education organised outside the formal education system (Åberg, 2016). In *folkbildning*, free and voluntary participation are essential principles, and *Bildung* remains a core value (Bjursell, 2019). With *Bildung* as the fundamental basis, *folkbildning* emphasises the individual's personal and cultural maturation and the development of their individuality as a human being (Bjursell, 2019). This study employs *Bildung* theory to examine how older adults' participation in education can support moral and intellectual growth regarding environmental issues (Öhman et al., 2025).

Research on non-formal environmental education for older adults

Lifelong learning has been emphasised as a vital component for engaging with the environment and promoting sustainable development, in which individuals are expected to adapt to the changes caused by climate change (UNESCO, 2017). Simultaneously, research on environmental and sustainability education rarely centres on older adults' learning and education. However, some studies do explore older adults' involvement in climate change activism. Pillemer et al. (2022) highlight several benefits of encouraging seniors to engage in climate activism. It can enhance seniors' health and self-efficacy, while also benefiting communities by involving seniors in environmental volunteer work. Older adults can serve as an important resource for a sustainable transformation (Pillemer et al., 2017). Conversely, seniors' lack of engagement with climate issues may partly explain their reduced involvement in environmental activism (Pillemer et al., 2022). Haq (2021) argues that there exists a form of ageism within the climate movement, based on

stereotypes and assumptions that seniors are passive and disinterested in climate issues. Younger climate activists have sometimes emphasised intergenerational injustice, accusing seniors of overconsumption and inaction regarding climate issues (Haq, 2021). Thus, older adults are sometimes described as a homogeneous group. However, it is important to clarify that seniors have different perspectives and values regarding what they consider important in sustainable development.

Research on adult learning related to sustainability is more advanced. Vandenabeele et al. (2024) suggest that studies on adult learning and sustainable development can be categorised into two main groups. One group is based on transformative learning theories (e.g., Moyer & Sinclair, 2020), and the other centres on radical popular education (e.g., von Kotze & Walters, 2023). Research in radical popular education often relates to Paulo Freire's critical pedagogy (Freire, 1972). Drawing from Freire's ideas, Misiaszek (2023) argues that ecopedagogy has the potential to challenge the anthropocentric dominance that separates humans from nature. von Kotze and Walters (2023) emphasise the significance of ecofeminism, highlighting the concept of cognitive justice as central to breaking the Western view of humans and nature. They stress that different types of knowledge should be recognised as valuable, enabling people to learn from each other. They argue that radical popular education has the potential to enable this process.

Within the framework that considers transformative learning as its foundation, Jack Mezirow's ideas have been central (Mezirow, 1981). Other initial points for transformative learning have also been explored, such as the relational or interpersonal aspects of the learning process (Boström et al., 2024). Gal and Gan (2020) emphasise that transformative learning can enhance students' understanding of social-ecological systems, partly by aiding in their knowledge construction and partly by promoting environmental engagement among participants. Walsh et al. (2020) explore learning in an eco-justice course and argue that a relational approach can support transformative learning. A systematic review (Moyer & Sinclair, 2020) focusing on studies rooted in transformative learning theory found that instrumental learning outcomes are prevalent. Participants acquire specific skills and knowledge related to various sustainability management fields. Consequently, there is a tendency to prioritise instrumental values in adult learning.

Whelan (2005) argues that popular education (folkbildning) has significant potential to promote social learning towards sustainability. Lysgaard et al. (2023) emphasise that there is scope to address current societal issues, such as climate change, but it is not certain that students participating in non-formal education share the same goals and ambitions as their teachers. Lysgaard et al. (2023) also raise the question of whether a new form of Bildung is necessary, in which alternative ways of understanding our relationship with nature and our manner of being can take centre stage.

Based on the above, we can conclude that there are different perspectives on how education for sustainable development should be organised for adults and older adults. Within Swedish folkbildning activities, there is no national curriculum that teachers are required to follow (Andersén et al., 2003). There is scope to discuss and select areas together with the participants. As mentioned earlier, Bildung has been a central part of the Scandinavian tradition of folkbildning. However, the forms of experience and Bildung that emerge when participants encounter content on nature, the environment, and sustainable development have not been extensively researched, and more knowledge is needed to understand the potential of this type of content for participants' learning and Bildung journeys.

Theory

This study expands on John Dewey's pragmatist perspective and concept of experience. In the study, the concept of experience helps explain participants' learning processes and how they create meaning through interactions within senior education. Additionally, Bildung theory is used to understand the outcomes of older adults' participation in education and the potential of that participation to contribute to their intellectual and moral growth regarding environmental issues.

Dewey's concept of *experience* clarifies that humans create meaning and value through reflections on their interactions with their social and natural environment. From a pragmatist perspective, an experience should be viewed holistically, encompassing past, present, and future experiences. An experience involves a whole with multiple aspects involved (Dewey, 1934/2005). Dewey introduces the idea of *modes of experience* to discuss various types of experience. According to Dewey (1934/2005), an experience is a whole where both emotional and intellectual aspects can be realised. Two key principles, interaction and continuity, are essential for understanding Dewey's notion of experience.

The *principle of interaction* explains the process of how we create meaning and value through our interactions with the social and natural environment. During an interaction, we turn to our previous experiences to guide our actions. We may face resistance in everyday life in different forms, prompting us to reflect on how to respond. Our actions induce responses from our environment, such as how people react to what we say or do. Humans try to adapt and coordinate their actions based on these outcomes (Dewey, 1938/1997). Through action, we gain knowledge about the world and create meaning in our lives. The *principle of continuity* highlights how past experiences can influence future ones. Dewey (1938/1997) emphasises that previous experiences shape and influence upcoming experiences. In this way, experiences hold the potential of intellectual as well as moral growth. At the same time, the world we live in evolves through the new experiences we create. Dewey's concept thus offers a way to understand the experiences seniors develop through their participation in the investigated course.

Dewey was influenced by the German ideas of Bildung and emphasised that reflective moral growth was crucial to cultivating democratic habits (Good & Garisson, 2010). The German thinkers Hegel and Herbart inspired Dewey's philosophy of education and his ideas about human growth (Retter, 2012; Väkevä, 2012). Väkevä argues that if Bildung is understood as self-development, 'in which the self gradually becomes aware of the conditions of its growth, and if this awareness is taken to require interaction with the world, including both the natural and cultural environment' (Väkevä, 2012, p. 276), Dewey can also be regarded as a thinker in the Bildung tradition.

Dewey (1922/2019) highlights that individuals' growth is grounded in their past experiences. Reactions from the social and natural environments can prompt us to reflect on and re-evaluate our values, leading to a change in how we relate to the environment. Such growth involves becoming 'someone' in relation to other people and society. However, it does not mean becoming something in relation to a specific, predetermined profession or position. Instead, growth relates to the student developing a broader range of responses to face the world and more ways to be themselves. The concept of freedom, therefore, is closely connected to the idea of Bildung as it can never be entirely predicted or predetermined.

This study uses Bildung theory to examine how older adults' participation in education can support moral and intellectual growth regarding environmental issues. Bildung is a complex idea with several different interpretations linked to it. Sjöström and

Eilks (2021) identify five educational traditions associated with the concept of *Bildung*. One of these traditions, the Scandinavian *folkbildning*, is relevant for this study. *Bildung* within this tradition includes a political dimension as *Bildung* is seen as something for all people. Scandinavian *folkbildning* activities are characterised by a freedom from the control of a national school curriculum (Andersén et al., 2003) and highlight values different from those emphasised by academic and formal education. For example, non-formal education for older adults emphasises intrinsic values, where learning is valued in itself. This contrasts with formal education, which focuses on instrumental values such as acquiring specific skills and grades (Schoultz et al., 2022). The course we are studying is offered at a folk high school and can be considered part of this tradition.

The journey towards *Bildung* occurs throughout life, not only through formal education. It is a continuous journey without a fixed destination, aimed at ongoing intellectual and moral growth. In this way, *Bildung* as an educational ideal contrasts with the instrumental approach that has increasingly characterised the education system in recent decades (Öhman et al., 2025). In instrumental education, learning becomes a political tool for shaping individuals with specific competencies that support a particular type of society. Knowledge then becomes a means for individuals to attain predefined competencies, presented as goals to be reached. Conversely, education as *Bildung* emphasises students' understanding of what matters to them and their future, as well as the ethical decisions they face in life. Thus, the distinct features of non-formal learning within the Scandinavian *folkbildning* tradition aim to support individuals' *Bildung* journeys.

Consequently, when *Bildung* is the intended outcome of teaching, it seeks to stimulate the intellectual and moral growth of the individual. Öhman et al. (2025) argue that intellectual growth involves developing a personal relationship with knowledge and making it meaningful and significant. It is about understanding the world as a whole and shaping one's role within it, rather than memorising isolated facts. Moral growth, they contend, is about combining knowledge with ethical values to develop good judgement, especially towards greater sustainability and responsibility for the survival of other species. This cannot be achieved without emotions. Emotions enable knowledge and ethics to translate into a morality that guides us to act with care for others. In short, education is about realising oneself as a true and good human being. In this study, the concepts of intellectual and moral growth will be used to discuss older adults' experiences in the investigated course and the course's potential to deepen participants' understanding of environmental and sustainable development.

Method and analytic procedure

The empirical data for this study were generated through semi-structured qualitative interviews with 11 participants who attended a course for senior citizens at a Swedish folk high school. A purposive sampling strategy was employed (Patton, 2015). The course also covers other topics on an ongoing basis, such as social studies and history, nutrition and health, and art. Each topic usually has a specific teacher. Participants could not choose which topics they wanted to partake in; if they enrolled in the course, they were expected to participate in all topics. The course was selected because it focused on nature and the environment. It was designed for people aged 55 and over and was organised by a folk high school located in a community in southern Sweden. The course consisted of two classes, each with 20-25 participants. Participants met twice a week. A common approach to teaching about nature and the environment was to first hold lessons at the folk high

school, then, later in the day, go on an excursion to examine in more detail what had been discussed there.

Participants were contacted between autumn 2023 and spring 2024. We communicated with a teacher, who provided the contact details of participants who might be interested in taking part. Eleven individual interviews were conducted with participants. Five participants were women and six were men. The participants are not active in working life. Each interview lasted between 30 and 50 minutes. The focus of the interviews was on the participants' experiences of the course and what they found particularly interesting and significant about it. To facilitate follow-up questions, the interviews were semi-structured. The teacher responsible for teaching the nature and environment theme was also interviewed to gain a better understanding of teaching practices. The participants were informed about the study both in writing and orally, with the purpose of the study and the confidentiality and voluntary nature of their participation being clarified. All interviews were transcribed, and participants' names were anonymised using pseudonyms. The research has been approved by the Swedish Ethical Review Authority (dnr-2023-05430-01).

The analysis of the empirical data focused on participants' experiences of the course. Emphasis was placed on the pedagogical potential of these experiences (Sandell & Öhman, 2010) to deepen participants' understanding of environmental and sustainable development. To clarify this potential, the analysis examined the experiences and values participants considered important to their engagement. Our understanding of their experiences is grounded in Dewey's theory of experience. The participant's experiences were accordingly approached holistically, encompassing past, present, and future. We thus focused on how participants created meaning and value by drawing on prior experiences, and on how those experiences have influenced their understanding of nature and the environment.

The analysis was a purpose-driven inductive analysis aimed at generating themes (Braun & Clarke, 2022; Kiger & Varpio, 2020). It consisted of four steps. Step one involved coding the empirical data, focusing on participants' diverse experiences from their course participation. The focus here was on what the participants highlighted as significant and valuable for their involvement in the course.

In step two, the analysis focused on participants' experiences of teaching, addressing questions about nature, the environment, and sustainable development. This phase highlighted the encounters, interactions, and processes that participants described when sharing their experiences of the course content, the role of the teacher, and their own learning.

In step three, the coded meaning units regarding participants' experiences of the course were classified into pedagogical potentials for intellectual and moral growth. The focus was on the types of experiences participants reported when commenting on the teaching and their learning, and how these experiences have changed participants' engagement with their environment.

The fourth step consisted of two parts. In the first part, the generated pedagogical potentials were grouped into themes to identify similarities (Kiger & Varpio, 2020). The themes we created were reviewed and refined multiple times by relating them to the overall empirical data. In the second part of this step, the themes were named to reflect their core content. Both researchers independently analysed the various themes. In cases of uncertainty, we employed a deliberative strategy (Goodyear et al., 2017), in which we compared our classifications and engaged in careful discussion to reach consensus before finalising the themes.

Findings

In this section, we explore themes related to the pedagogical potential to deepen older adults' understanding of nature, environmental issues, and sustainability. Five themes were created: *Potential to gain new and deeper perspectives on nature and the environment*; *Potential to foster critical reflection on politics*; *Potential to re-evaluate values and knowledge in a sustainable transformation*; *Potential to take responsibility for other individuals and future generations*; and *Potential to recognise the rights of other species*. Illustrative examples of older adults' reflections on their experiences in the course support these findings.

Potential to gain new and deeper perspectives on nature and the environment

This theme explores participants' experiences regarding new and broader knowledge about nature and the environment. One example includes experiences of insights into the topography of nature, such as soil conditions and terrain. Participants emphasised the value of receiving this type of information and that it has given them a new understanding of why nature appears a certain way in different places. One participant, Clara, states that it is both exciting and interesting to acquire new knowledge about this. The course includes field trips, which have been particularly important in creating a positive experience. Evelyn notes that the new knowledge alters the way you perceive things. During a field trip, she discovers that some of the stone cairns they encounter are actually human-made terraces, not the ice sheet as she had initially believed. Thus, the experiences from the course enable them to view nature and the environment in their surroundings differently and open new perspectives for the participants.

Evelyn further explains that the organisation of popular education, where the focus is not on grades and exams, creates favourable conditions for exploring such issues. Participants also emphasise that discovering and experiencing new places is exciting. Participant Clara highlights that 'I grew up around here, even though I have not lived here for many years, I have discovered new places that I have never seen before'. Participants have also gained new interests through the course. Participant Albert describes:

We go out and can look at rocks and minerals. We can go up, there is a quarry a few kilometres from here, and then you can see these different layers. It is very interesting, something I have never been interested in before.

Albert discusses further, 'But Oliver (the teacher) is really good at that, he tells us all about them and them and them, it is actually quite exciting'. The teacher's own knowledge is essential in ensuring participants have a positive experience of the course. In this case, the teacher's in-depth understanding of the subject has ignited the participant's interest in a topic he previously knew little about, but which has since become increasingly fascinating.

Participants' experiences also have the potential to deepen understanding of nature, including learning more about vegetation, animals, and how the natural world operates. Cornelia explains that they often observe environments and vegetation, noticing how they appear different:

Yes, then he gives an explanation like why it looks like this and why is this only coniferous forest and different questions like that, then we are out in this coniferous forest that all of a

sudden it changes to a deciduous forest or mixed forest or something and then he explains why.

In this case, the teacher's choice of content creates disorientation, fostering reflection among participants. By choosing a location where the vegetation changes, participants begin to reflect on why it appears as it does.

In summary, this theme illustrates how the course has the potential to support the participants in gaining new knowledge about nature and the environment. The participants highlight the visit to different natural sites during the course, as particularly meaningful. Things they have not previously considered, they now recognise. The course content has helped participants foster experiences that lead them to view the natural world around them differently, thereby expanding their understanding of nature's development.

Potential to foster critical reflection on politics

This theme examines participants' reflective experiences from the course, concerning what constitutes a good society. The participants have experienced a variety of perspectives on topics like the energy issue, agriculture and forestry. Based on the course content, several participants have begun reflecting on a sustainable transformation of our society.

One way for the teacher to engage the participants was to choose content based on current events they were aware of. Since there was much news about Sweden experiencing high energy costs during a certain period, this also became a topic that the participants discussed and learnt more about during the course. Through these discussions, participant Frank has started to reflect on future work involving sustainable energy: 'We must constantly find new and better ways to work with energy. It is a huge problem that will never go away. Solar and wind may be part of the future, but I do not think it is enough'. This quote demonstrates that the participant has begun to consider how society should address the energy issue. The experienced content in the course challenges his previous experiences. Frank finds it difficult to envision a long-term solution without recurring inquiry into different possibilities. Sustainable energy production is a challenge where society cannot simply rely on past knowledge and continue along the same path.

Several participants also emphasise that it was interesting to discuss how nuclear power operates to consider other issues, such as whether investing in nuclear power stations is economically advantageous for society. Evelyn explains:

Then no one has said like that it's reprehensible or it's clear that you should have it, but here you have been given facts and then you have had to think for yourself. 'Ah, but God, it takes so long before it starts to pay back, then they're almost scrapped, does that make sense?' So, there are things like this that make you think a lot.

The quote illustrated that Evelyn has begun to consider how society should address the energy problem and what role nuclear power should play. The teacher tries to clarify that there are different notions regarding how a problem should be solved, without suggesting that a particular perspective is the correct answer. By encountering content that presents different perspectives, participants start to discuss and reflect on various ideas and attempt to make sense of what they encounter.

Through the content the participants have experienced in the course, they have also started to reflect on how to make the best use of available resources. One participant, Frank, reflects on agricultural land and the fact that housing and industry are being built

in inappropriate locations. Frank explains that alternative options, such as constructing a golf course, are preferable because they do not cause long-term damage to the land. Several participants note that society has prioritised other issues, while finding good solutions remains challenging. Roy explains:

That's the problem today, I think, everyone wants a better environment, but no one wants to do anything about it so...it's the money. Those who govern today are often a little older, they don't want to change anything either, so the environment is constantly being penalised, it's very difficult to make changes.

The quote demonstrates how participants rely on their political experience to reflect on why the problems associated with sustainable development remain unresolved. Roy stresses that mainly political priorities and a reluctance to change, rather than a lack of knowledge, are the core problems. One participant, Gilbert, points out the risk of rushing to solutions, where 'politicians move too fast for ideological reasons'. Gilbert finds it hard to see how the problem can be resolved. There is concern that society and politicians lack sufficient experience and knowledge to develop long-term, sustainable solutions. This highlights the tension in society over the pace of transformation to a more sustainable future. There is worry that rushing solutions might not lead to a truly sustainable society.

The participants' experiences from the course can enable educational opportunities to develop a different understanding of the local environment and how political decisions influence the ability to manage available resources sustainably. Throughout the course, participants have encountered various problems that society needs to address, prompting them to critically consider the possibilities and challenges of a sustainable transformation.

Potential to re-evaluate values and knowledge in a sustainable transformation

This theme concerns participants' reflective experiences on sustainable development and the dilemmas it presents. During the course, they discussed carbon dioxide levels and greenhouse gases. Cornelia emphasises that she has gained a lot of new knowledge that she has not reflected on before:

There are a lot of things where you think that a cow can't do any harm, I kind of think like that.... But I have learnt that they emit gases and that it's not good for us to eat meat and all that, so...yes.

The course induces feelings of disorientation. By engaging with different perspectives and knowledge throughout the course, Cornelia has re-evaluated her previous values and understanding to address the disorientation she experienced. Furthermore, participants have been informed about how global warming functions and how their lifestyle impacts the Earth. Participants emphasise that sustainable development was not a concept or topic discussed when they were growing up. Participant Albert states: 'When I grew up, sustainable development wasn't on the map, it wasn't discussed at all.' The quote shows that participants often lack prior experience that would help them understand sustainable transformation and the challenges involved. The reflective experiences about sustainable development within the course have the potential to deepen participants' understanding of the societal challenges and dilemmas we face.

During the course, participants are often exposed to different perspectives on issues related to sustainable development, such as invasive species, palm oil, and organic farming. Participants describe experiencing diverse viewpoints as valuable. Participant

Albert further explains the importance of encountering different truths and how it can provide new perspectives:

Before, you've sort of decided if you've seen an episode on the news, you've decided that it's too damn bad, but a real eye-opener is that he (the teacher) can pick out the different perspectives or the different truths as well.

By engaging with various perspectives on sustainable development, participants can reflect on their own positions in relation to the content they encounter. The course thus has the potential to enable participants to grow intellectually.

Through their experiences in the course, the participants have also started to reflect on sustainable development and the importance of relevant knowledge. Cornelia emphasises that much of the knowledge that was natural in the past has been forgotten, but now we are starting to revisit it. She uses plastic bags as an example:

I mean, when I was little, there were no plastic bags that you bought and put fruit in, for example, always paper bags. But then you got used to only being allowed to use plastic bags, there was nothing else in the shops. But it's a piece of shit, frankly. But now the paper bags have come back, to make it airy and nice.

In this case, participants draw on their past experiences to understand and interpret how sustainable development has evolved within society, and how, in some areas, we are now beginning to revert to previous knowledge and ways of life. Participant Evelyn also elaborates on this topic, discussing relevant knowledge and highlighting how excursions can enable this type of reflective experience. During an excursion, they visited a nature reserve where they learned more about how people in the past had to work with nature and how 'they dammed water so that resources would not run out. We talk about a lot of that, and we are a little bit back to that today'. The theme highlights that the course experience can generate reflections, in which participants draw on their previous experiences. The experiences they create during the course allow participants to re-evaluate and ascribe new meaning to their previous experiences and knowledge.

Potential to take responsibility for other individuals and future generations

In this theme, participants' experiences highlight the importance of working towards sustainable development from the perspective of fellow human beings and of future generations' ability to inhabit the Earth. During the course, questions about the climate were discussed. Several participants describe concerns about how their children and grandchildren will be affected. Clara states: 'Yes, of course, we have talked about the climate, and then you can be worried about your children and grandchildren, how it will be. We use the earth's resources so madly'. Learning more about nature and the environment is regarded as very important. Participants have also begun to think more about the use of Earth's resources, as Frank further explains: 'Yes, it is like I said before that we should be careful with the resources we have, I guess. We waste too much of them'. During the course, participants have gained new experiences and engaged in discussions that sparked reflection.

Albert explains that he feels older adults are becoming increasingly involved in these issues and that attitudes among his generation have changed:

Greta (Thunberg) was just such a grumpy person or whatever you want to call it, but now (mimics that the participants start to reflect) that this is probably serious. She's not just... her thoughts are not entirely wrong, her attitude...

Participants reassess their previous beliefs about the climate crisis. Participant Albert develops new values related to sustainable societal change through his experiences with Greta Thunberg's work and the principles she advocates.

The importance of using the Earth's resources responsibly was emphasised by several participants, highlighting that both individuals and society share this responsibility. Participants note that their experience of the course has also given them a better foundation for making informed decisions and choices related to sustainable development. By attending the course, they have begun to reflect on the potential of their fellow human beings to live a good life on Earth. Cornelia explains:

There must be enough for everyone, and there is a symbiosis in all of this. So, it's a matter of where to start if you think you're going to do something. If I am going to be able to do something about this, then you need to do the little things.

The course content prompts her to reflect on her own role, and Cornelia's understanding of this issue, in relation to the transformation to sustainability, is that everyone has a responsibility to try to do something, even if it is not a significant effort.

While participants mention that they have started to consider their responsibilities towards others more, there are also ethical questions about what the correct course of action might be. Participant Evelyn gives an example: 'If we did not have fertiliser, perhaps a third of the world's population would not exist. At the same time, it leads to emissions, so it is not only positive.' The quote demonstrates that dilemmas are a significant part of the course content and that encountering different perspectives on a topic is valuable. By reflecting on content where the answer is not clear-cut, participants become more aware of the ethical complexity involved. The theme shows that participants' experiences from the course can create educational opportunities to foster caring for others and future generations.

Potential to recognise the rights of other species

This theme explores participants' experiences concerning the rights of other species to inhabit Earth and how human activities can both support and obstruct animal welfare. During the course, topics such as forestry and wetlands have been treated. Several participants discuss the possibility of animals living fulfilling lives and how human actions make this difficult. Respect for nature and the importance of engaging in activities with greater thoughtfulness are emphasised as central themes. Clara describes how her generation has not been very considerate of the resources we have on Earth:

Because we who are at this age, around 65-70, we have lived in a time when there have been unlimited resources somewhere in the best of worlds. We haven't had to think about it so much...Oh, I'll buy a new one or something and throw away the old one. But we have to stop there.

The participant emphasises the importance of respecting nature and its resources, drawing on childhood experiences. Taking the course prompts reflections on the actions of his generation and their consequences.

Throughout the course, participants have considered how human activities impact animals' environments. For example, they have discussed drainage and its effects on animals' habitats. Participant Albert emphasises that it is interesting to learn more about these connections: 'And we should probably take care of the wetlands, but now wetlands are being recreated to take a step back, so to speak. Many of these animals in the wetlands must also live'. The quote demonstrates that the participant is engaged in ethical deliberation and believes this knowledge is significant. The value of justice for other animals emerges through the discussions and reactions among the participants.

Although the participants emphasise that they have gained new knowledge that has made them reflect on the possibilities for other species to live and the responsibilities they hold, some participants also discuss that they have acquired knowledge that confirms the importance of the commitments and actions they already undertake. Gaining this kind of knowledge can also help them to take different actions in the future. Evelyn talks about how her role as a consumer is enhanced by gaining more knowledge:

Then I am aware of what packaging I choose to avoid and what kind of products I buy and so on and animal husbandry and all that, I am very careful about that. What kind of product I buy as a consumer.

In this case, the knowledge that participants acquire during the course can also support them outside the course context in making other choices and taking different actions. The experiences gained from the course could therefore lead to new types of experiences beyond it.

During the course, participants also discussed invasive species. The discussions focused on what steps to take, both within a municipality and as a private individual, if you have invasive species on your property. Roland explains:

Usually it's Oliver (the teacher) who brings the knowledge to us and we listen and we question whether they are endangered plants or plants that we don't want. And how do we deal with these plants, for example. Take these plants that you are going to remove in your garden, which are invasive, and it becomes such a discussion. Invasive species or non-invasive species and what is our perception of these species?

The quote shows ethical deliberation in which the participant considers the survival of different species. Removing invasive species is not always straightforward; it also depends on their role in the current environment. Therefore, it is not always clear what the right action is.

In summary, during the course, the participants experienced various types of content focusing on the situation of other species, which sparked ethical reflection on the relationship between humans and nature.

Discussion

This study aims to explore the pedagogical potential of non-formal courses to enhance older adults' understanding of the environment and sustainable development. We specifically focused on older adults' learning experiences and their potential to enhance their understanding of the environment and sustainable development. The study illustrates that Dewey's (1922/2019) *principle of interaction* is vital to understanding the participants' experiences and learning process. When they interact with the course content, participants make sense of it and create knowledge by using their previous experiences. The participants are prompted to reflect on how their own behaviour, as well

as society, needs to change in the future. Thus, when learning occurs, there is *continuity* among past, present, and future experiences. From a folkbildning perspective, we can understand these experiences as a journey towards Bildung in environmental and sustainability issues. In the following, we will discuss the educational outcomes and the identified pedagogical potentials in relation to the concepts of Bildung and intellectual and moral growth.

Intellectual growth involves participants acquiring a deeper understanding of nature and the environment, as well as critically reflecting on societal development (Öhman et al., 2025). The themes, *Potential to re-evaluate values and knowledge in a sustainable transformation*, and *Potential to foster critical reflection on politics*, demonstrate how participation in education may contribute to intellectual growth. The course encouraged senior participants to re-evaluate society's industrial development, highlighting how the political emphasis on development and the economy has led not only to positive outcomes but also to unintended consequences. Over their lifetime, perspectives on industrial development have shifted from viewing it as beneficial to seeing it as a problematic factor in the global crisis. This aligns with Misiaszek (2023), who discusses education and the potential to challenge the Western anthropocentric view which places humans at the centre, subordinating the values of nature. Additionally, other values have become prominent, such as recycling and repairing materials and equipment. Values once taken for granted are now being revitalised. Participants emphasise the importance of slowing down the lifestyle in which things are used and discarded rapidly.

Moral growth involves participants' reflections on the responsibilities they hold and the principles they consider essential regarding nature, the environment, and sustainable development (Öhman et al., 2025). The theme *Potential to recognise the rights of other species* shows how the senior participants value respect and justice for other species on Earth. The course promotes discussion and reflection on the opportunities for other species to lead good lives and on how human activity affects their well-being. Accordingly, participation in education has the potential to highlight the survival of other species as an essential starting point for understanding sustainability challenges. This aligns with Lysgaard et al. (2023), who discusses whether a new form of Bildung is necessary, where alternative ways of understanding the relationship between humans and nature are brought to the forefront.

It is crucial to recognise that the moral and intellectual aspects of Bildung do not occur in isolation from each other. The theme *Potential to take responsibility for other individuals and future generations* illustrates that changing values are a potential outcome of older adults' participation in education and that seniors regard this as significant for their participation in the course. Acquiring, for example, more information and knowledge about climate change serves both intellectual and moral values, encouraging reflections on how to act and the prospects for future generations to live on Earth. This aligns with Öhman et al. (2025), who emphasise that we do not rely solely on knowledge to comprehend our interactions; moral and ethical considerations greatly influence how we experience a situation and decide to act. When humans encounter situations in life, both intellectual and moral dimensions are activated simultaneously, even if reflection afterwards reveals that one particular dimension may have been more prominent in a given situation.

Biesta (2002) argues that the concept of Bildung must connect to the problems and challenges we face today. We believe that content related to the environment and sustainable development has the potential to contribute specifically to participants' growth. The course encouraged participants to reflect on what knowledge is essential for a sustainable transformation and to re-evaluate their own understanding and past

experiences. Bildung can thus become a lifelong journey. Seniors have lived long lives, and their experiences are valuable to embrace. They possess experiences and knowledge that are reactivated and can serve as valuable resources (e.g., Pillemer et al., 2017). At the same time, it is important to recognise that individuals' personal learning and education in this area do not automatically mean that the issue of a sustainable societal transformation will be resolved. This focus risks shifting responsibility solely onto individuals, potentially neglecting the role of collective, economic, and structural measures in achieving sustainable transformation.

It is important to emphasise that the study does not allow us to conclude that the participants have grown intellectually and morally or that they have changed their behaviours and ways of relating to nature. Older adults may find it harder to change, as barriers can stem from deeply ingrained perspectives or resistance to change. The study shows older people are interested in sustainable development and hold knowledge vital for societal change (Haq, 2021). Participants display curiosity to change their views on environmental and sustainability issues. At the same time, the study's sample size is relatively small, and the participants who have actively enrolled in a course like this may be more open to learning new viewpoints and knowledge. Nonetheless, the sampling was connected to the study's purpose of exploring how older adults' experiences within the course can be regarded as pedagogical potentials to enhance their understanding of the environment and sustainable development.

The study indicates that non-formal education has the potential to support society's sustainable transformation and older adults' journey towards Bildung (Whelan, 2005). Older adults' participation is not driven by the desire to gain professional qualifications or skills. Several participants in this study emphasise that acquiring more knowledge is engaging and enjoyable, as well as discussing different dilemmas that encourage reflection. This aligns with previous research (Schoultz et al., 2022), which underlines the intrinsic value of learning as a key element in education for seniors. The study's findings show that pedagogical potential is realised through discussing and interacting with other participants about the content, which aligns with von Kotze and Walters (2023), who emphasise the importance of exchanging knowledge. Contributing to this is teachers' freedom to address various types of educational content, which creates opportunities to critically examine different perspectives and evaluate diverse forms of knowledge. Since the transformation to a sustainable society involves creating a new societal framework, it cannot rely solely on society's previous knowledge. There is a risk that it will simply replicate the same patterns of behaviour that perpetuate the misuse of Earth's resources.

From a democratic standpoint, it is vital that all citizens have the possibility and ability to participate in the transformation into a more sustainable future (Haq, 2021). It is therefore essential that educational organisations offer older adults' opportunities to deepen their knowledge and gain new perspectives on sustainable development. Our study indicates that folkbildning courses can play a significant role in supporting seniors' intellectual and moral growth regarding environmental and sustainability issues. The new insights derived from such courses, combined with lifelong experiences, emphasise an often-overlooked potential within older adults for society's sustainable transformation.

Declaration of conflicting interests

The authors declare no potential conflicts of interest with respect to the research, authorship or publication of this article.

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